



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,451	03/31/2004	Phillip Wong	63564-012 (ACCL-120)	5449

7590 04/18/2005

Mark G. Lappin
McDermott, Will & Emery
28 State Street
Boston, MA 02109

EXAMINER

THOMAS, COURTNEY D

ART UNIT PAPER NUMBER

2882

DATE MAILED: 04/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/814,451

Applicant(s)

WONG ET AL.

Examiner

Courtney Thomas

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☒ Claim(s) 31-34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>09/07/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 6, 7, 13, 19 and 31 are objected to because of the following informalities:
2. Claim 6, line 1 recites: "...said planar light beam..." Examiner notes there is no antecedent basis for the use of this term. Dependent claim 7 is similarly objected to.
3. Claim 13, line 6 recites: "... said light axis..." Examiner notes there is no antecedent basis for the use of this term (see also claim 31, line 10 "the distance"; line 11, "the time").
4. Claim 19, lines 1-2 recite: "... wherein said one or more light sources form a linear array of light sources." Examiner notes that the condition of one light source fails to satisfy the limitation of forming a linear array of light sources.
5. The claims have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the claims.
6. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-4, 16-18, 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Koertge (U.S. Patent 5,878,112).

Art Unit: 2882

9. **As per claims 1-4, 16-18 and 20-22**, Koertge discloses an X-ray system comprising an X-ray source (5) controller (9 - see also column 4, lines 34-38) and a collision avoidance subsystem (9) comprising means for preventing a head and arm assembly from effecting a collision with an object in one or more predetermined exclusion zones; wherein the subsystem comprises sensors and means responsive to an alarm signal to interrupt motion of an arm or head (Abstract; column 2, lines 29-45; see also column 4, lines 19-23; 50-63).

Claim Rejections - 35 USC § 103

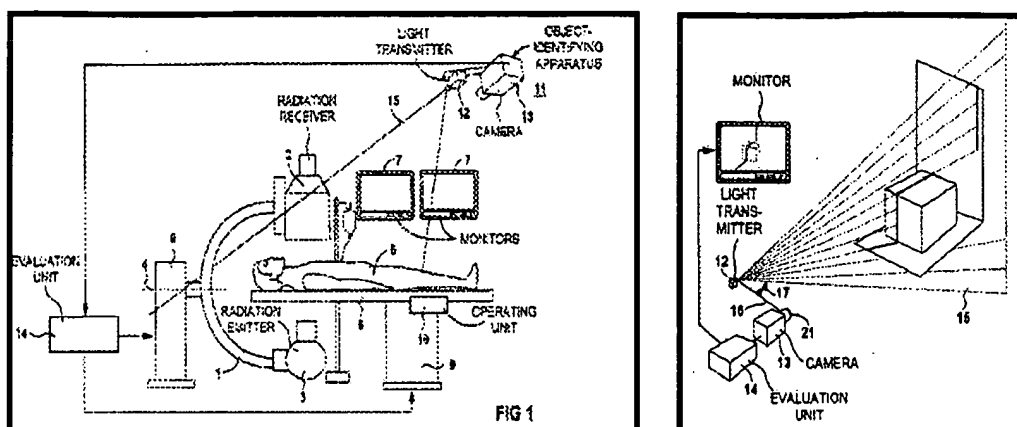
10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5-12, 19 and 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koertge (U.S. Patent 5,878,112) in view of Alexandrescu (U.S. Patent 6,272,368).

12. **As per claims 5-12, 19 and 23-29**, Koertge discloses an X-ray system as recited in claim 1, but does not explicitly disclose a system wherein the collision avoidance subsystem comprises one or more light sources effective to establish a substantially planar light beam between at least one of an exclusion zone and an emission head, wherein the controller is responsive to an object (or user action in response to an object) extending through the light beam to interrupt the motion of the head.

13.



Figs. 1 & 2 – Medical Installation with collision avoidance system – U.S. Patent 6,272,368 to Alexandrescu

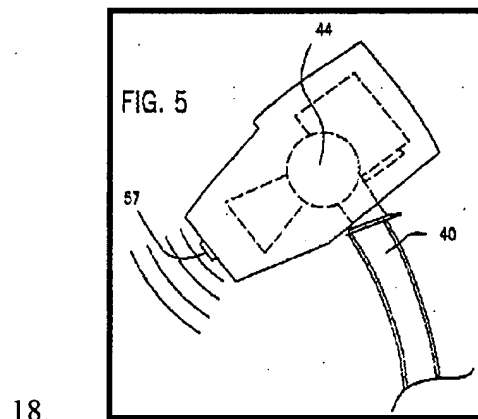
14. Alexandrescu discloses an X-ray system having a collision avoidance system including one or more light sources (12) effective to establish a substantially planar light beam within an exclusion zone, whilst a controller (10) is responsive to an object (or user action in response to an object) extending through the light beam to interrupt the motion of system components (Abstract; column 1, lines 54-67, column 2, lines 1-24; see Figs. 1 & 2 shown above). Alexandrescu teaches that such an arrangement eliminates the need for component sensors for determining component positions and enables the X-ray system to possess a compact and simple structure.

15. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Koertge such that it incorporated the collision avoidance system of Alexandrescu. One would have been motivated to make such a modification for the purpose of eliminating the need for component sensors for determining component positions thereby providing an X-ray system having a compact and simple structure as suggested by Alexandrescu (column 2, lines 1-4).

Art Unit: 2882

16. Claims 13-15 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koertge (U.S. Patent 5,878,112) in view of Hinton et al. (U.S. Patent 5,485,502).

17. As per claims 13-15 and 30, Koertge discloses an X-ray system as recited in claim 1, but does not explicitly disclose a system wherein the collision avoidance subsystem comprises a) an array of acoustic transducers fixedly coupled to an x-ray source and b) means for determining from received back-scattered acoustic energy the distance between the X-ray source and the object.



19.

table 12 or may be of unusual size. For this reason, one or more ultrasonic transducers 57 may be incorporated into various portions of the radiation source 44, arm 40 and detector array 50 so as to detect a close proximity between these surfaces and another surface during control of the radiographic system 10. For example, when the pendant 22

Figure 5 & Column 12, lines 53-58 – U.S. Patent 5,485,502 to Hinton

20. Hinton teaches an X-ray system comprising a) one or more acoustic transducers (57) fixed to an X-ray source, wherein each of the transducers transmits a succession of acoustic pulses along a transmission axis extending from the X-ray source and detects acoustic energy back-scattered along the axis from an object and b) means (56 - not shown above) for determining from the received back-scattered acoustic energy the distance between the X-ray

Art Unit: 2882

source and the object and in response, interrupting motion of the emission head (Abstract; column 2, lines 10-60; column 12, lines 47-64).

21. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Koertge such that it incorporated the array of acoustic transducers and determining means of Hinton. One would have been motivated to make such a modification for the purpose of accurately identifying the proximity between two surfaces to avoid collision as taught by Hinton (column 12, lines 58-64).

Allowable Subject Matter

22. Claims 31-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

23. The following is a statement of reasons for the indication of allowable subject matter:

24. **As per claim 31**, the examiner found no reference in the prior art that disclosed or made obvious a radio-surgery X-ray system further comprising a photo-detector for detecting light from the planar light beam that is back-scattered from the object.

25. **As per claim 32 and dependent claim 33**, the examiner found no reference in the prior art that disclosed or made obvious a radio-surgery X-ray system wherein the collision avoidance subsystem comprises a laser rangefinder for detecting the presence and location of an object in one or more exclusion zones and wherein the laser rangefinder includes: a) a transmitter for generating laser light and transmitting the laser light toward at least one of the exclusion zones, b) a receiver for receiving laser light that is generated by the transmitter and that is back-scattered from the object, c) a photo-detector for detecting the intensity of the light received by

Art Unit: 2882

the receiver and d) a data acquisition system effective to communicate a distance to the object by measuring a time required for the laser light to reach the object and return to the transmitter.

26. **As per claim 34**, the examiner found no reference in the prior art that disclosed or made obvious a radio-surgery X-ray system wherein the collision avoidance subsystem comprises a laser rangefinder for detecting the presence and location of an object in one or more exclusion zones and wherein the laser rangefinder includes: a) means for generating laser light and transmitting the laser light toward at least one of the exclusion zones, b) means for receiving laser light that is generated by the transmitter and that is back-scattered from the object, c) means for detecting the intensity of the light received by the receiver and d) means for measuring a time required for the laser light to reach the object and return to the transmitter, thereby determining a distance to the object.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (571) 272-2496. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink that reads "Courtney Thomas". The script is cursive and fluid.

Courtney Thomas
Examiner
Art Unit 2882